



UNITED STATES PATENT AND TRADEMARK OFFICE

AK
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,586	02/09/2001	Toshiro Hayakawa	Q61222	6818

7590 11/21/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037-3202

EXAMINER

JACKSON, CORNELIUS H

ART UNIT	PAPER NUMBER
----------	--------------

2828

DATE MAILED: 11/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/779,586

Applicant(s)

HAYAKAWA, TOSHIRO

Examiner

Cornelius H. Jackson

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.



PAUL IP

SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Acknowledgment

1. Acknowledgment is made that applicant's Response, filed on 08 September 2003, has been entered.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 1, 4-9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 1, 4-9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how, or in what

way, does the modulation unit modulate the surface-emitting semiconductor element, as stated in claim 1. Claims 4-9 and 11 are rejected for depending on an indefinite base claim.

6. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite since it is unclear how a mirror realizes anytime, not to mention a structure.

7. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite since it is unclear how an active layer realizes anytime, not to mention a structure.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 4-6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kafka et al. (5365366). Kafka et al. discloses a laser apparatus **FIG. 1** comprising a semiconductor laser element **28** which emits first laser light **34** having a first wavelength; a surface-emitting semiconductor element **20** which is excited with the first laser light **24**, emits second laser light having a second wavelength which is longer than the first wavelength, and has an active layer **20** and a first mirror **14** arranged on one

side of the active layer **20**; a second mirror **16** which is arranged outside the surface-emitting semiconductor element **20** so that the first and second mirrors **14,16** form a resonator in which the second laser light resonates; and a modulation unit which modulates the surface-emitting semiconductor element **20**, wherein the second mirror **16** is physically separated from the surface-emitting semiconductor element by an air gap, **see col. 3, line 49-col. 6, line 55**.

Regarding claims 4-5, Kafka et al. discloses a structure for controlling the spatial mode **108** and all the other stated limitations, **see col. 8, line 59-col. 10, line 15**.

Regarding claim 6, Kafka et al. discloses the first mirror has a limited area being arranged in parallel with a light-exit end surface of the surface-emitting semiconductor element, **see FIG. 1**.

Regarding claim 9, Kafka et al. discloses all the stated limitations, **see FIG. 1**.

10. Claims 1-7, 9, 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Tayebati et al. (6438149). Tayebati et al. discloses a laser apparatus **FIG. 2** comprising a semiconductor laser element which emits first laser light having a first wavelength, **see col. 3, lines 63-67, col. 9, lines 55-65 and col. 13, lines 21-32**; a surface-emitting semiconductor element **6,10,24,28** which is excited with the first laser light, emits second laser light having a second wavelength which is longer than the first wavelength **see col. 4, lines 20-26 and col. 10, lines 4-29**, and has an active layer **6** and a first mirror **10** arranged on one side of the active layer **6**; a second mirror **12** which is arranged outside the surface-emitting semiconductor element so that the first and second mirrors **10,12** form a resonator in which the second laser light resonates;

Art Unit: 2828

and a modulation unit which modulates the surface-emitting semiconductor element **6,10,24,28**, wherein the second mirror **12** is physically separated from the surface-emitting semiconductor element by an air gap **8**, **see col. 9, line 55-col. 13, line 32**.

Regarding claims 2, 3, 12 and 13, Tayebati et al. disclose the surface-emitting semiconductor element **6,10,24,28** has both a pn **see col. 13, lines 21-32** and Schottky junction **24,28** and the modulation unit modulates the surface-emitting semiconductor element by varying a voltage applied to the junctions.

Regarding claims 4-5, Tayebati et al. disclose a structure for controlling the spatial mode and all the other stated limitations, **see col. 3, lines 23-39 and col. 6, line 10-col. 7, line 42**.

Regarding claim 6, Tayebati et al. discloses the first mirror **10** has a limited area being arranged in parallel with a light-exit end surface of the surface-emitting semiconductor element, **see FIG. 2**.

Regarding claim 7, Tayebati et al. discloses the active layer **6** is formed in only a limited area in a plane parallel to a light-exit end surface of the surface-emitting semiconductor element.

Regarding claim 9, Tayebati et al. discloses all the stated limitations, **see FIG. 2**.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tayebati et al. (6438149). Tayebati et al., as applied to claims 1-7, 9 and 11-13 above, teach all the stated limitations except for the size of the structure for controlling the spatial mode of the second laser light and how the surface-emitting semiconductor element is pumped. Regarding claim 8, it would have been obvious to one of ordinary skill in the art at the time the invention was made to design the structure for controlling the spatial mode of the second laser light having a specific size, since it has been held "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 11, it is well known in the art that a surface-emitting semiconductor element may be pumped by a laser light entering the cavity through the air gap and it would have been an obvious matter of design choice to arrange how to pump the surface-emitting semiconductor element, since applicant has not disclosed that pumping the cavity through the air gap solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the surface-emitting semiconductor element being pumped from the bottom.

Double Patenting

13. Claim 13 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 2. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Response to Arguments

14. Applicant's arguments filed 08 September 2003 have been fully considered but are moot in view of the new ground(s) of rejection, except for the following arguments:

a. "The Examiner has applied element number 20 of the reference as teaching two separate limitations. Applicant submits that applying the same element in the reference as allegedly teaching two separate elements of the claims is improper.

b. Kafka et al. fail to teach or suggest the first mirror recited in claim 1, since the mirror in which the Examiner relies upon is an entirely separate element and not on the active layer.

c. Kafka et al. fail to teach or suggest the second mirror arranged outside the surface emitting semiconductor element so that the first and second mirrors form a resonator in which the second laser light resonates.

d. Kafka et al. fail to teach or suggest the modulation unit in claim 1, since the temperature controller circuit simply controls the temperature of the LBO crystal.

In response to Applicant's arguments:

a. Although the Examiner has applied element number 20 of the reference as teaching two separate limitations, the two separate limitations makes up one element.

b. The mirror, which the Examiner relies upon, is as applicant has claimed, e.g. arranged on one side of the active layer. It is noted that the features upon which applicant relies (i.e., the first mirror arranged being attached on one side of the active layer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

c. Kafka et al. teach the second mirror arranged outside the surface emitting semiconductor element so that the first and second mirrors form a resonator in which the second laser light resonates, **see col. 3, line 58-col. 6, line 45, esp. col. 3, lines 58-65 and col. 6, lines 39-45.**

d. It is well known in the art that the sensitivity of the LBO crystal to temperature may be used to vary the central wavelength; therefore the temperature controller circuit may modulate the output.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,390,689 B1 teaches a similar invention which may be used in combination with Tayebati et al. above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cornelius H. Jackson whose telephone number is (703) 306-5981. The examiner can normally be reached on 8:00 - 5:00, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

CHJ
chj

Paul Ip
PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800